IN THE CLAIMS:

Please amend the claims as follows:

1. (Currently Amended) A method for performing channel equalization in a receiver [[(*2*)]], in which a signal is received from a communication channel, the signal containing symbols ~~(*S(B1)*)~~ formed of binary information by phase shift keying, channel estimation is performed to estimate the properties of the communication channel, and samples are taken of the received signal at intervals, **characterized** in that in the method,

a determined number of samples are examined,

a decision step is taken, in which, to find out [[the]] transmitted symbols ~~(*S(B1)*)~~, [[the]] bit decisions ~~(*B*)~~ are computed on the basis of said ~~defined quantity~~ determined number of samples, and

after each decision step, ~~it is examined~~ examining whether said decision step is to be iterated,

wherein upon iteration of said decision step, at least some of the bit decisions of the previous decision step are used in addition to the samples under examination, in the computation of the bit decision.

2. (Previously Presented) The method according to claim 1, **characterized** in that for performing said decision step, a cost function is defined

$$f(B)=\frac{1}{2}\sum_{t=0}^{T}\left(\left\|r_t-\sum_{s=0}^{H-1}h_s S(B_{t-s})\right\|^2-\sum_{s=0}^{H-1}\bar{h}_s h_s \bar{S}(B_{t-s})S(B_{t-s})+\sum_{k=1}^{M}\left(b_{t,k}-\frac{1}{2}\right)^2\right),$$

in which *S(B)* is the symbol corresponding to bits B, h_s are the estimated channel coefficients, and *r* is the received signal which is sampled, and that said cost function *(f(B))* is subjected to minimization.

3. (Currently Amended) The method according to claim 2, **characterized** in that in the method, to minimize said cost function, said decision step is iterated, and in which [[the]] an update rule

$$b_{l,k}(j+1) = f_h\left(\sum_{t=l}^{l+H-1} re\left\{\bar{r}_t h_{t-l}\frac{\Delta S(B_l)}{\Delta b_{l,k}}\right\} - re\left\{\bar{h}_{t-l}\frac{\Delta \bar{S}(B_l)}{\Delta b_{l,k}}\sum_{q=0,t-q\neq l}^{H-1} h_q S(B_{t-q})\right\}\right),$$

is used, where $B_l = \lfloor b_{l,1}, b_{l,2}, ..., b_{l,M} \rfloor$ is M bits at the moment $l = u + l\Delta u$, $S(B_l)$ is the corresponding symbol, $\frac{\Delta S(B_l)}{\Delta b_{l,k}}$ is a derivative with respect to k bits, h indicates the communication channel, of which H channel taps are estimated, and $f_h(x)$ is a hard limit function which receives the value 1, if $x > 0$, else 0.

4. (Currently amended) The method according to claim ~~1, 2 or~~ 3, **characterized** in that in the update rule, noise is added before taking said decision step.

5. (Currently Amended) A receiver comprising

- means [[(4)]] for receiving a signal from a communication channel, the signal containing symbols ~~($S(B_l)$)~~ formed of binary information by phase shift keying,
- a channel estimator [[(17)]] for estimating the properties of the communication channel,
- a channel equalizer [[(7)]], and
- means ~~(5, 15a-15d)~~ for sampling the received signal at intervals,

characterized in that the channel equalizer [[(7)]] comprises means ~~(16a-16c)~~ for examining a number of samples defined at the time, decision means ~~(18a-18c)~~ for computing bit decisions [[(B)]] on the basis of said ~~defined~~ number of samples to find out transmitted symbols ~~($S(B_l)$)~~, and examining means [[(11)]] for estimating the need for iterating the computation of the bit decisions [[(B)]], wherein upon iterating said computation of bit decisions [[(B)]], at least some

of the bit decisions of the previous decision step are arranged to be used in addition to the samples under examination at the time.

6. (Currently Amended) The receiver according to claim 5, **characterized** in that for computing said bit decisions [[(*B*)]], the receiver comprises means ~~(16a-16c)~~ for minimizing the cost function

$$f(B)=\frac{1}{2}\sum_{t=0}^{T}\left(\left\|r_t-\sum_{s=0}^{H-1}h_s S(B_{t-s})\right\|^2-\sum_{s=0}^{H-1}\bar{h}_s h_s \bar{S}(B_{t-s})S(B_{t-s})+\sum_{k=1}^{M}\left(b_{t,k}-\frac{1}{2}\right)^2\right),$$

in which *S(B)* is the symbol corresponding to bits B, h_s are the estimated channel coefficients, and *r* is the received signal which is sampled.

7. (Currently Amended) The receiver according to claim 6, **characterized** in that the decision means comprise means (18a–18c) for computing an update rule

$$b_{l,k}(j+1)=f_h\left(\sum_{t=l}^{l+H-1} re\left\{\bar{r}_t h_{t-l}\frac{\Delta S(B_l)}{\Delta b_{l,k}}\right\}-re\left\{\bar{h}_{t-l}\frac{\Delta \bar{S}(B_l)}{\Delta b_{l,k}}\sum_{q=0,t-q\neq l}^{H-1}h_q S(B_{t-q})\right\}\right)$$

where $B_l=\lfloor b_{l,1},b_{l,2},\ldots,b_{l,M}\rfloor$ is *M* bits at the moment $l=u+l\Delta u$, $S(B_l)$ is the corresponding symbol, $\frac{\Delta S\ (B_l)}{\Delta b_{l,k}}$ is a derivative with respect to *k* bits, *h* indicates the communication channel, of which *H* channel taps are estimated, and $f_h(x)$ is a hard limit function which receives the value 1, if $x > 0$, else 0.

8. (Currently Amended) The receiver according to claim 7, **characterized** in that it comprises computing units ~~(16a-16c)~~, each of which are arranged to determine one symbol value on the basis of said defined number of samples, that the output of each computing unit ~~(16a-16c)~~

is coupled to the input of at least one other computing unit ~~(16a-16c)~~, for using the symbol values defined by the computing units ~~(16a-16c)~~ in the next computation of the bit decision.

9. (Currently Amended) The receiver according to claim 8, **characterized** in that each computing unit ~~(16a-16c)~~ contains as many iteration blocks ~~(18a, 18b, 18c)~~ as the bit number of symbols formed in [[the]] a modulation.

10. (Previously Presented) The receiver according to any of the claims 5 to 8, **characterized** in that the means for examining the number of samples determined each time comprise a delay line (15a–15d) in which the number of delays is one less than the number of symbols ($S(B_l)$) to be determined from said defined number of samples.

11. (Currently Amended) The receiver according to any of the claims ~~5 to 10~~ 7 to 8, **characterized** in that it comprises means ~~[[*n*]]~~ for adding noise in the update rule before computing said bit decisions.

12. (Currently Amended) The receiver according to any of the claims 5 to 11, **characterized** in that it comprises means ~~(11)~~ for setting an initial value for the bits before computing said bit decisions.

13. (Currently Amended) A channel equalizer ~~(7)~~ comprising means ~~(5, 15a-15d)~~ for sampling a signal received from a communication channel at intervals, which received signal contains symbols ~~($S(B_l)$)~~ formed of binary information by phase shift keying, and which received signal has been subjected to channel estimation for estimating the properties of the communication channel, **characterized** in that the channel equalizer comprises means ~~(16a-16c)~~ for examining a number of samples defined at a time, decision means ~~(18a-18c)~~ for computing bit decisions ~~(*B*)~~ on the basis of said ~~defined~~ number of samples to find out [[the]] transmitted symbols ~~($S(B_l)$)~~, and examining means ~~(11)~~ for estimating the need for iterating the

computation of [[the]] bit decisions ~~(*B*)~~, wherein upon iterating said computation of bit decisions ~~(*B*)~~, at least some of the bit decisions of the previous decision step are arranged to be used in addition to the samples under examination at the time.

14. (Currently Amended) A wireless communication device comprising

- means ~~(4)~~ for receiving a signal from a communication channel, the signal containing symbols ~~($S(B_i)$)~~ formed of binary information by phase shift keying,
- a channel estimator ~~(17)~~ for estimating the properties of the communication channel,
- a channel equalizer ~~(7)~~, and
- means ~~(5, 15a-15d)~~ for sampling the received signal at intervals,

characterized in that the channel equalizer ~~(7)~~ comprises means ~~(16a-16c)~~ for examining a number of samples defined at the time, decision means ~~(18a-18c)~~ for computing bit decisions ~~(*B*)~~ on the basis of said ~~defined~~ number of samples to find out [[the]] transmitted symbols ~~($S(B_i)$)~~, and examining means ~~(11)~~ for estimating the need for iterating the computation of [[the]] bit decisions ~~(*B*)~~, wherein upon iterating said computation of bit decisions ~~(*B*)~~, at least some of the bit decisions of the previous decision step are arranged to be used in addition to the samples under examination at the time.